Jacob Pfund

**Award:** Undergraduate Student Research; $3800.00

**Status:** Sophomore, Physics

**Advisor:** Seth King

**Research Topic:** Exploring Properties of Zinc Oxide/Graphene  
 Hybrid Structures

**Abstract:** Indium tin oxide (ITO) is a commonly used material in the production of transparent conducting films. However, indium is toxic, environmentally unfriendly, and expensive. To remedy this issue, a new material must be developed which can serve as a replacement for ITO. This project utilized commercially available zinc oxide powder and graphene nanoplatelets to manufacture nanocomposite materials through ultrasonic homogenization. To investigate their physical properties, these nanocomposites were then subjected to UV-Vis spectroscopy, particle size analysis, scanning electron microscopy, and X-ray diffractometry. Results indicate that ZnO/Graphene nanocomposites have promising potential as an inexpensive and environmentally friendly transparent conductor.

**Biography:** Jacob Pfund is a sophomore physics major at UW-La Crosse. He is currently performing summer research on Zinc Oxide/Graphene hybrid structures at Dr. Seth King’s Lab at UWL. Jake also has participated in several other summer research internships at both UWL and UW-Madison. These include spending the summer at the Wisconsin Geological and Natural History Survey in 2013, working at the Weibel biochemistry lab at UW-Madison in 2014, and performing research at Dr. King’s lab in 2016.

**Congressional District:** 3

**Congressional Representative:** Ron Kind